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21st September 2004
Oy/gro (20030498)
Q03013WO10

Axial setting device

Claims

1. An axial setting device for actuating a multi-plate coupling (2) in the driveline of a motor vehicle, comprising

   a housing (3) in which there are supported two parts (4, 5) so as to be coaxially rotatable relative to one another, which two parts (4, 5) can be coupled to one another by the multi-plate coupling (2) arranged in the housing,

   a cylinder unit (15) with a hydraulic chamber (22) and a piston (21) which is arranged in the hydraulic chamber so as to be axially displaceable and which is provided for actuating the multi-plate coupling(2),

   a hydraulic system for supplying the cylinder unit (15), comprising a quantity of oil jointly contained in the housing (3) and in the hydraulic chamber (22), the hydraulic system further comprising a pump (18) which comprises a first connection (23) connected to the housing (3) and a second connection (24) connected to the hydraulic chamber (22).

2. An axial setting device according to claim 1,

   characterised in

that the pump (18) is designed in such a way that oil can be conveyed from the housing (3) to the hydraulic chamber (22) and vice versa.

3. An axial setting device according to claim 1 or 2,

characterised in

that the pump (18) is firmly connected to the housing (3) and that, in the housing, there is provided an aperture (25) connecting the first connection (23) to the interior of the housing (3) and a channel (28) connecting the second connection (24) to the hydraulic chamber (22).

4. An axial setting device according to claim 3,

characterised in

that, between the aperture (25) and the first connection (23), there is provided an antechamber (26) in the housing (3).

5. An axial setting device according to claim 3 or 4,

characterised in

that the channel (28) is provided in the housing (3) only.

6. An axial setting device according to any one of claims 1 to 5,

characterised in

that, in the hydraulic system between the housing (3) and the first connection (23) of the pump (18), there is provided a filter element (27, 35).

7. An axial setting device according to claim 6,

characterised in

that a filter element (27) is provided in the aperture (25).

8. An axial setting device according to claim 6,

characterised in

that the filter element (35) is associated with the first connection (23) of the pump (18).

9. An axial setting device according to any one of claims 1 to 8,

characterised in

that between the second connection (24) and the hydraulic chamber (22), there is provided a pressure sensor (29) which is connected to an electronic control unit (17).

10. An axial setting device according to any one of claims 1 to 9,

characterised in

that between the second connection (24) and the hydraulic chamber (22), there is provided a controllable check valve (31).

11. An axial setting device according to any one of claims 1 to 10,

characterised in

that the pump (18) is designed as an internal gear pump and comprises a hollow gear (39) with an internal trochoid (43) as well as a rotor (44) with an external trochoid (45).

12. An axial setting device according to claim 11,

characterised in

that the internal trochoid (43) of the hollow gear (39) is formed by a plurality of rotatable gears (42) being inserted in partially cylindrical recesses (41) of the hollow gear (39) and that the rotor, along its external trochoid (45), comprises a toothed structure which engages the teeth of the gears (42).

13. An axial setting device according to any one of claims 1 to 12,

characterised in

that the pump (18) can be driven by an electric motor (19) and is controllable by the electronic control unit (17).

14. An axial setting device according to claim 13,

characterised in

that the pump (18) and the electric motor (19) form one unit and are positioned on a common longitudinal axis (X').